To: Seyfried, Erin[Seyfried.Erin@epa.gov]
Cc: Heather.Ptak@shell.com[Heather.Ptak@shell.com]
From: Lana.Davis@shell.com
Sent: Fri 8/23/2013 9:26:42 PM
Subject: RE: Geotech Questions

Hi Erin –

Okay I've double checked with our drilling engineer and he says the table below in the AOGA RFAI is correct. The calculated solids discharges are correct (table below), to the best of our knowledge and experience. The engineer maintains it is very difficult to estimate these numbers without having a good handle on the subsurface conditions we will encounter. So, for now we'll stay with the best guess of 7,000 g/d discharge of muds and cuttings this number does includes a lot of entrained seawater that carry the reported solids out of the borehole.

I believe that should answer all your questions, but If you have any more questions please feel free to contact me.

Cheers,

Lana

Table 2 in AOGA

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Technology	Borehole Diameter	Cuttings and Drilling Fluids Discharged / Borehole by Depth								
		50 ft			200 ft			499 ft		
		Cuttings	Mud	Total	Cuttings	Mud	Total	Cuttings	Mud	Total
Conventional Rotary Drilling on Vessel	7 in	11 ft^3	22 ft^3	33 ft^3	48 ft^3	89 ft^3	137 ft^3	124 ft^3	223 ft^3	347 ft^3
	8 in	15 ft^3	22 ft^3	37 ft^3	64 ft^3	89 ft^3	154 ft^3	165 ft^3	223 ft^3	388 ft^3
	9 in	20 ft^3	23 ft^3	43 ft^3	85 ft^3	89 ft^3	174 ft^3	213 ft^3	223 ft^3	437 ft^3
Con Rot Drilling on Ice	8 in	15 ft^3	--	15 ft^3	65 ft^3	--	65 ft^3	166 ft^3	--	166 ft^3

From: Seyfried, Erin [mailto:Seyfried.Erin@epa.gov]
Sent: Wednesday, August 07, 2013 11:32 AM
To: Davis, Lana SEPCO-UAA/A/SD
Subject: RE: Geotech Questions

Thanks, Lana! The responses are very helpful!

Erin E. Seyfried, M.S.

Environmental Engineer

U.S. EPA Region X, Suite 900

NPDES Permits Unit, OWW-130

1200 6th Ave. | Seattle, WA 98101

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From: Lana.Davis@shell.com [mailto:Lana.Davis@shell.com]
Sent: Wednesday, August 07, 2013 12:28 PM
To: Seyfried, Erin
Subject: RE: Geotech Questions

Hi Erin.

Below are the answers we have so far. We're still working on your second questions. I hope to have it to you soon. I think our Drilling Engineer is out of phone / internet range for a little

while. As soon as Cary gets back in service range I'm sure he'll respond. Until then here you go, see answers in red text below:

1) In the NPDES permit application (Form 2C) the desalination unit wastes are listed as having a mean daily flow of 10,320 m^3/day (which happens to be the same flow provided for non-contact cooling water). Is this correct? Or is this a typo? This rate is significantly greater than the rate provided for exploration well desal discharges. The Fugro Explorer has a max non-contact cooling discharge rate of 10,320 m3/day, but the max desalination unit discharge rate is 109,440 gallons/day (415 m3/day). These numbers are based on data provided by the vessel, best guess estimates.

2) In the NPDES permit application (Form 2C), a rate of 7,000 gpd is provided for muds/cuttings (at the seafloor), however, when I was looking over estimated volumes of muds/cuttings (Table 2 of the "AOGA Response" to our May 2013 questionnaire), the numbers don't seem to correlate. What am I missing? Does the estimated discharge rate include entrained seawater? We have send this question off to our Drilling Engineer (Cary) to help sort this out. Stay tuned.

3) The NPDES permit application does not request coverage for "boiler blowdown", but this is still included in the AOGA response document. I just wanted to confirm that this is not a requested discharge. The Explorer does not have a boiler, however many vessels do have auxiliary boilers for heating purposes (especially vessels equipped for the arctic conditions). I think we wanted to include boiler blow down discharges in the permit to cover any vessels that might have a boiler. If a vessel has a boiler, they need to have the ability to blow down.

4) Based on the Geotech Presentation last week (7/25 – and thanks, again, for putting that on, very helpful!), Cary stated that the possible 2014 Geotech Program would include 30 boreholes in the Chukchi and 7 boreholes in the Beaufort. I was wondering, how many of these holes are likely to be "deep" holes, and how many are "shallow." For purposes of distinguishing shallow vs. deep holes, is it okay to state that shallow is <50 feet in depth, and deep is >50 feet in depth? Chukchi: 22 shallow borings (< 50 ft) and 6 deep (actually 2 deep assessment and 4 deep platform) 28 borings for the Chukchi.

Beaufort: 5 shallow borings < 50 ft) and 2 deep (<300ft).

From: Seyfried, Erin [mailto:Seyfried.Erin@epa.gov]
Sent: Tuesday, August 06, 2013 11:03 AM
To: Ptak, Heather A SEPCO-UAA/A/SD; Davis, Lana SEPCO-UAA/A/SD
Subject: RE: Geotech Questions

That's great. Thanks!

Erin E. Seyfried, M.S.

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From: Heather.Ptak@shell.com [mailto:Heather.Ptak@shell.com]
Sent: Tuesday, August 06, 2013 11:57 AM
To: Seyfried, Erin; Lana.Davis@shell.com
Subject: RE: Geotech Questions

Erin,

Yes, sorry I haven't gotten back to you yet. We do have responses to several of these. I'll ask Lana to pass those along. We're still trying to get in touch with our drilling engineer to answer some of the others. We'll try and track him down today and see what we can find out.

Thanks,

Heather

From: Seyfried, Erin [mailto:Seyfried.Erin@epa.gov]
Sent: Tuesday, August 06, 2013 10:53 AM
To: Ptak, Heather A SEPCO-UAA/A/SD
Subject: FW: Geotech Questions

Hi Heather – Have you had a chance to look into these questions? I have been working out of the office since last Friday (more productive when I lock myself in my home office!), and am hoping to get the Geotech gp and supporting documents to internal review shortly so I can stay on track with the proposed schedule.

If you would like to schedule a time to talk about these questions, just let me know (I won't be in the office until Thursday, and I will be out of the office on leave Friday and Monday).

Thank you,

Erin

Erin E. Seyfried, M.S.

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From: Seyfried, Erin
Sent: Thursday, August 01, 2013 11:28 AM
To: Heather.Ptak@shell.com
Subject: Geotech Questions

Hi Heather – Here are the questions I had for geotech (just wanting to clarify a few things). We can schedule a time to talk about this later, or feel free to just respond via email if that is easier/ more convenient.

5) In the NPDES permit application (Form 2C) the desalination unit wastes are listed as having a mean daily flow of 10,320 m^3/day (which happens to be the same flow provided for non-contact cooling water). Is this correct? Or is this a typo? This rate is significantly greater than the rate provided for exploration well desal discharges.

6) In the NPDES permit application (Form 2C), a rate of 7,000 gpd is provided for muds/cuttings (at the seafloor), however, when I was looking over estimated volumes of muds/cuttings (Table 2 of the "AOGA Response" to our May 2013 questionnaire), the numbers don't seem to correlate. What am I missing? Does the estimated discharge rate include entrained seawater?

7) The NPDES permit application does not request coverage for "boiler blowdown", but this is still included in the AOGA response document. I just wanted to confirm that this is not a requested discharge.

8) Based on the Geotech Presentation last week (7/25 – and thanks, again, for putting that on, very helpful!), Cary stated that the possible 2014 Geotech Program would include 30 boreholes in the Chukchi and 7 boreholes in the Beaufort. I was wondering, how many of these holes are likely to be "deep" holes, and how many are "shallow." For purposes of distinguishing shallow vs. deep holes, is it okay to state that shallow is <50 feet in depth, and deep is >50 feet in depth?

Thank you!

-Erin

Erin E. Seyfried, M.S.

Environmental Engineer

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